CLAIMS:

1. A contrast agent for medical imaging techniques, comprising particles (1) consisting of at least a core (2), the core (2) comprising at least an oxide, mixed oxide, or hydroxide of at least one element selected from the group consisting of Mg, Ca, Sr, Ba, Y, Lu, Ti, Zr, Hf, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Mo, W, Mn, Fe, Co, Ni, Cu, Zn, Cd, Si, and Bi.

2. The contrast agent according to claim 1, wherein the core (2) comprises MO, $M(OH)_2$, M_2O_3 or $M(OH)_3$ and M = Ca, Sr, Ba, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, or Bi, or a mixture thereof.

3. The contrast agent according to claim 1, wherein the core (2) comprises Gd_2O_3, $Gd(OH)_3$, $(Gd,M)_2O_3$, $(Gd,M)(OH)_3$ and M = Y, La, Ce, Pr, Nd, Sm, Eu, Tb, Dy, Ho, Er, Tm, Yb, Lu or Bi, or a mixture thereof.

4. The contrast agent according to any of the foregoing claims, wherein the core (2) comprises Gd_2O_3, $Gd(OH)_3$, $(Gd,Bi)_2O_3$ or $(Gd,Bi)(OH)_3$, or a mixture thereof.

5. The contrast agent according to claim 1, wherein the core (2) comprises $M'M''O_4$ (M' = Gd, Bi, Fe; M'' = P, Nb, Ta) or $M'_2M''_2O_7$ (M' = Gd, Bi, Fe; M'' = Si, Ti, Zr, Hf) or $M'_2M''O_5$ (M' = Gd, Bi, Fe; M'' = Si, Ti, Zr, Hf) or $M'_4(M''O_4)_3$ (M' = Gd, Bi, Fe; M'' = Si, Ti, Zr, Hf) or $M'_2(M''O_4)_3$ (M' = Gd, Bi, Fe; M'' = Mo, W) or $M'_2M''O_6$ (M' = Gd, Bi, Fe; M'' = Mo, W), or a mixture thereof.

6. The contrast agent according to claim 5, wherein the core (2) contains ^{98}Mo as lattice material and/or the lattice is doped with ^{98}Mo.

7. The contrast agent according to claim 6, wherein the amount of doping ranges between 0.01 and 50 mol-%.

8. The contrast agent according to any of claims 5 to 7, wherein the core (2) comprises one of the formulations selected from the group consisting of $GdPO_4$:Mo (1.0 mol-%), $Gd_2Si_2O_7$:Mo (5.0 mol-%), or $Gd_2(WO_4)_3$:Mo (10 mol-%).

9. The contrast agent according to claim 1, wherein the core (2) comprises at least one of the group consisting of elementary Fe, γ-Fe_2O_3, Fe_3O_4, a ferrite material with spinel-, garnet-, or magnetoplumbite-structure, or any other hexagonal ferrite structure.

10. The contrast agent according to claim 9, wherein the spinel-structure is formed of MFe_2O_4 and M = Mn, Co, Ni, Cu, Zn, or Cd.

11. The contrast agent according to claim 9, wherein the garnet-structure is formed of $M_3Fe_5O_{12}$ and M = Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, or Lu.

12. The contrast agent according to claim 9, wherein the magnetoplumbite-structure is formed of $MFe_{12}O_{19}$ and M = Ca, Sr, Ba, or Zn.

13. The contrast agent according to claim 9, wherein the hexagonal ferrite-structure is formed of $Ba_2M_2Fe_{12}O_{22}$ mit M = Mn, Fe, Co, Ni, Zn, or Mg.

14. The contrast agent according to any of claims 9 to 13, wherein the core (2) is additionally doped with Mn, Co, Ni, Cu, Zn, or F.

15. The contrast agent according to claim 14, wherein the amount of doping ranges between 0.01 and 5.00 mol-%.

16. The contrast agent according to any of the foregoing claims, wherein the particle (1) further comprises at least one optional shell (3-5) on the core (2).

17. The contrast agent according to claim 16, wherein at least one of the optional shells (3-5) contains a radioactive isotope.

18. The contrast agent according to claim 17, wherein the radioactive isotope is ^{19}F.

19. The contrast agent according to any of claims 17 to 18, wherein the radioactive isotope is present in an amount of 0,001 to 50 mol-%.

20. The contrast agent according to any of claims 17 to 19, wherein the at least one optional shell (3-5) containing the radioactive isotope has a thickness of 1 to 50 nm, preferably 1 to 10 nm.

21. The contrast agent according to claim 16, wherein the at least one optional shell (3-5) consists of precious metal, preferably Au, Pt, Ir, Os, Ag, Pd, Rh or Ru and more preferably Au.

22. The contrast agent according to claim 21, wherein the at least one optional shell (3-5) of precious metal covers the core (2) completely.

23. The contrast agent according to any of claims 21 or 22 wherein the at least one optional shell (3-5) of precious metal has a thickness of 1 to 50 nm, preferably 1 to 10 nm.

24. The contrast agent according to claim 16, wherein at least one further shell (3-5) is present, providing bio-compatibility.

25. The contrast agent according to claim 24, wherein the at least one biocompatibility shell (3-5) has a thickness of 1 to 50 nm, preferably 10 to 50 nm.

26. The contrast agent according to claim 16, wherein at least one further

shell (3-5) is present, containing at least one antibody.

27. The contrast agent according to claim 26, wherein the at least one antibody is a tumor-specific antibody.

28. The contrast agent according to claim 26, wherein the at least one antibody containing shell (3-5) further contains one or more proteins, preferably the HIV-tat protein.

29. The contrast agent according to any of the foregoing claims, wherein the core (2) has a spherical, oval or lens shape.

30. The contrast agent according to any of the foregoing claims, wherein the core (2) has a diameter of 1 to 500 nm, preferably 5 to 50 nm.

31. A pharmaceutical formulation comprising a contrast agent and a pharmaceutically acceptable excipient, wherein the contrast agent is formed according to any of the foregoing claims; and wherein the formulation is suitable for administration as an imaging enhancing agent and the contrast agent is present in an amount sufficient to enhance a magnetic resonance tomography (MRI) image, a magnetic particle imaging image, a positron emission tomography (PET) image, a single photon emission computed tomography (SPECT) image, a computed tomography (CT) image, or an ultrasound (US) image.

32. The pharmaceutical formulation of claim 31, wherein the pharmaceutical acceptable excipient is a buffered saline.